Do market forces erode moral actions? Revisiting Dewatripont and Tirole (2024)

Jean-Marie Baland, Giorgio Ferroni

September 2026

DeFiPP Working Paper 2026-06

DeFiPP
Development Finance & Public Policies
defipp.unamur.be

UNIVERSITÉ DE NAMUR

Do market forces erode moral actions? Revisiting Dewatripont and Tirole (2024)

Jean-Marie Baland * Giorgio Ferroni†

September 2026

This version updates and replaces the earlier version (DeFiPP Working Paper 2026-03).

Abstract

Dewatripont and Tirole (2024) show that firms' moral conduct in the market is independent of competitive pressure. We argue that such a result hinges on consumers' ability to identify each producer's moral conduct —an assumption that is, in general, unlikely to hold. Specifically, the number of firms and demand elasticity matter if consumers have only a general perception of morality in the market. In such a setting, morality becomes a public good: firms bear the full cost of their moral behaviour while capturing only a fraction of the benefits from increased consumer willingness to pay.

JEL classifications: D2, D4, D21, D8

Keywords: Competition, markets, morality, information

*DEFIPP, University of Namur, CRED, rempart de la Vierge 8, B-5000 Namur, Belgium, jean-marie.baland@unamur.be

†DEFIPP, University of Namur, CERPE, rempart de la Vierge 8, B-5000 Namur, Belgium, giorgio.ferroni@unamur.be, corresponding author

We thank Mathias Dewatripont, François Maniquet, and Jean Tirole for helpful comments.

1 Introduction

The role of market forces in eroding moral values is an age-old debate in economics. In a recent paper, Dewatripont and Tirole (2024) revisit this question and propose a powerful and robust argument showing that the moral behaviour of firms is independent of the strength of competition on the market. [1] This "irrelevance result" relies on the idea that an ethical (consequentialist) firm producing goods can also choose some costly moral action which is perfectly observable by the consumers. It is motivated to do so by both its own intrinsic morality, but also by the possibility of charging higher prices to ethically minded consumers. By the envelope theorem, the amount of moral action chosen by producers in equilibrium is independent of the degree of competition they face.

In the present note, we qualify this result, by stressing the critical role played by the assumption of perfect information, according to which the moral action taken by the firm is perfectly observable by consumers (for instance because the firm is able to credibly communicate about it).[2] We instead consider here that consumers can only observe the "average" morality of a sector, and not the specific level of moral action chosen by a particular firm. In other words, moral action is conceived here as a common good to a sector, to which individual firms contribute voluntarily. When many firms compete on the same market, it is indeed hard for consumers to be informed on the particular action of a specific firm. They instead rely on a global perception or an average information about moral practices at work in the sector (such as child labor, fair market practices, product and labor safety, eco-friendly practices, labor conditions, use of corruption and influence, ...).

For example, many of the scandals that emerged recently (BP commitment to environmental standards and the Deepwater horizon, the contamination of organic food, Volkswagen emissions scandal, Nestle water bottles, blood diamonds, H&M "conscious" collections, ...) were the result of a particular firm misconduct that nevertheless shed doubts and tarnished the reputation of a whole sector. In this context, attempts by a particular firm to effectively communicate about its practices are not credible and are interpreted as green- or moral-washing. [3] (Clearly, some moral actions by the firms, such as donations to charities, can be observed, but many are not. Eco- or fair trade- labelling is one way to remedy this problem (Dragusanu, Giovannucci, and Nunn (2014); Baland and Duprez (2009); **?**).

Drawing on the basic model proposed by Dewatripont and Tirole (2024), we show that their irrelevance result does not hold when consumers cannot be informed about the moral actions of individual firms: an increase in competition does imply a fall in morality when consumers value it positively (the reverse holds true if they have a negative valuation). Morality is a public good, and the rationale for this result directly follows from the voluntary contribution argument, the amount of which decreases (increases) with the number of

[1] This does not imply that the amount of moral action produced under market competition is maximal, but that the amount chosen by a particular firm is simply not affected by competition.

[2] For completeness, the results by Dewatripont and Tirole (2024) carry over even if a fraction of consumers is *completely* uninformed about or insensitive to the firms' moral conduct. Nevertheless, the point of this note remains valid

[3] Interestingly Acharya, DeMarzo, and Kremer (2011) show that disclosure of bad market news (like toxic assets of some banks) can trigger release of information by individual firms to signal their relatively good state. In this context, the clustering information disclosure by relatively healthy firms may mitigate the fall in consumers' trust in the market

contributors (Olson, 1968).[4]

In connecting moral erosion to consumers' inability to identify firms' moral action the present note is related to the literature on collective reputation. Early works have shown that when group and individual characteristics are imperfectly observed, negative actions by earlier members can lead to stigmatisation of new members and generate a self-reinforcing cycle (Tirole, 1996; Levin, 2009). More recent works have focused on the trade offs of collective branding. Fishman, Finkelstein, Simhon, and Yacouel (2018) and Nocke and Strausz (2023) pinpoint what conditions guarantee that firms prefer to contribute to the brand reputation instead of free-riding on each other's effort since collective branding provides consumers with more information about the products' quality compared to single brands. Neeman, Öry, and Yu (2019) show that while collective branding generates incentives to free-ride on other firms' in the long run, it also acts as a commitment device mitigating the temptation to milk a good individual reputation in the short run; the quality of the signal structure and consumers' prior beliefs determine which effect will dominate.

In our note, however, we keep as close as possible to the original (Dewatripont and Tirole, 2024) paper, without delving into dynamic incentives and just assuming that consumers observe the average level of morality "produced" in the market.

A word is in order on the type of competition. Whether firms compete in quantities or in prices turns out to matter for how tight the erosion result is. Under quantity competition a firm's moral action does not affect its own output choice and, therefore, leaves every competitor's demand unaffected: the public-good logic sketched above goes through with no further qualification, a pure "morality dilution" effect. Under price competition, however, a firm's moral action also perturbs demand of every rival because it moves the sector-wide average morality that enters everyone's price and therefore demand, a "competition" effect. In this case, moral dilution is still at play and, on top of it, the more competitive the market, the less incentives firms have to behave morally.

2 The moral erosion result

2.1 The framework

The model follows closely the one proposed by Dewatripont and Tirole (2024). There are n suppliers, $i \in \{1, ..., n\}$ and a mass 1 of unit-demand, price-taking clients. The outside option is indexed by 0. Suppliers compete in price and non-price dimensions.[5] Supplier i selects its price p_i as well a moral or ethical choice a_i, both in R^+, and faces a demand function $D_i(\hat{\boldsymbol{p}})$, where $\hat{\boldsymbol{p}} \equiv (\hat{p}_1, ..., \hat{p}_n)$ denotes the vector of supplier net prices. The vector $(p_i; a_i)$ determines the "net price" $\hat{p}_i$ perceived by the consumers, as described below (p_0 is the net price for the exogenous outside option). Products are substitutes, so that the demand for product

[4] Our result is related to the discussion provided by Ponthière and Stevens (2025), who focus on the idea that moral actions, when mediated by the market, lose part of their essence. They propose a version of the model with a parameter β, that we can reinterpret in our context as the probability of observing a firm's moral action. Under our argument, this probability falls in the number of firms in a sector.

[5] As Dewatripont and Tirole (2024) put it (p. 2666): "We look at Nash equilibria of the industry game in which the suppliers select simultaneously their price and their ethical action and then consumers select their supplier or choose the outside option." Throughout, we maintain this simultaneous-move, Nash timing: each firm i chooses (p_i, a_i) taking every other firm's raw price p_k and moral action a_k, $k \neq i$, as given.

i is decreasing in its net price $\hat{p}_i$ and increasing in the net prices of other suppliers.

Besides price p_i, supplier i picks a level of morality $a_i \in [0, \bar{a}_i]$ with $\bar{a}_i \leq +\infty$ per unit of output. This choice has an impact on the welfare of the firm, $W_i(a_i)$, with $W_i'(a_i) > 0$ and $W_i''(a_i) < 0$ on $[0, \bar{a}_i)$. The outside option, "good 0", generates an exogenous welfare $w_0 \equiv W_0(a_0)$. The vector $\boldsymbol{a} \equiv (a_1, ..., a_n)$ represents the ethical choices of all suppliers. We denote $a^M = \frac{1}{n}\sum_j^n a_j$ the mean level of morality among the n suppliers[6]. Unless otherwise stated, we depart here from Dewatripont and Tirole (2024) and assume that the ethical choices made by individual producers are not observable by consumers, but the average level of morality of all firms in a given market is.

The consumers' cost or benefit of a moral action is captured through its monetary equivalent $\phi(a^M)$ with $\phi''(a^M) \geq 0$, such that the consumers' demand for product i depends only on its net price p_i (and on the net prices charged by other suppliers through the average morality level):

$$\hat{p}_i \equiv p_i + \phi(a^M)$$

These are the only formal changes we bring to Dewatripont and Tirole (2024)'s model, who instead assume $\hat{p}_i \equiv p_i + \phi_i(a_i)$. As in the original paper, the extent to which consumers care about a^M is independent of the price.

Firms care about profits, but also have social preferences, as reflected in their internalization of welfare. Supplier i's internalization of social welfare, $W_i(\hat{\boldsymbol{p}}; \boldsymbol{a})$, depends on net prices and ethical choices. The unit cost of production, c_i, depends on the ethical actions taken by the firm a_i: $c_i(a_i)$, with $c_i'(a_i) \gtrless 0$ and $c_i''(a_i) > 0$ for all a_i. Each firm i maximizes a weighted sum of profits and social welfare.

$$V_i \equiv [p_i - c_i(a_i)]D_i(\hat{\boldsymbol{p}}) + \alpha_i \mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) \tag{1}$$

where $\alpha_i \geq 0$ stands for her intrinsic ethics or the intensity of her social preferences, which is common knowledge. Suppliers "ethical welfare", $\mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a})$, is given by [7]:

$$\mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) \equiv \sum_{j=0}^{n} W_j(a_j)D_j(\hat{\boldsymbol{p}})$$

This implies that producers also derive utility proportionally to the demand for the outside option, $D_0(\hat{\boldsymbol{p}})$.

An equilibrium is a vector of prices and ethical choices $(\hat{\boldsymbol{p}}^*, \boldsymbol{a}^*)$ such that consumers maximise utility by selecting their supplier or the outside option given net prices, and suppliers maximise their objective function simultaneously.

[6] Here we are implicitly assuming that consumers do not attribute more weight to any firm in the formation of the average "moral capital" of the market. All results in this paper would hold if we assumed weights such that $a^M \equiv \sum_j \omega_j a_j$ with $\sum_j \omega_j = 1$ and $\omega_j \geq 0$ and such that w_j is increasing in the market share of firm j.

[7] Note that this implies that, unlike consumers, suppliers are aware of each other's ethical choice. Alternatively, we could have assumed that individual moral choices are not known by suppliers, in which case we could write $\mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) \equiv \sum_j^n W_j(a^M)D_j(\hat{\boldsymbol{p}})$, while W_j remains common knowledge. We discarded this formulation for simplicity since our focus is on consumers' valuation for morality

2.2 The irrelevance result

We first reproduce here the results of Dewatripont and Tirole (2024), based on three key assumptions:
Assumption 1 (consequentialism)**.** *All players (suppliers, consumers, workers, investors)' perception of the social impact of their trade is proportional to the size of this trade.*
Assumption 2 (flexible prices)**.** *Prices are (locally) flexible at equilibrium price configuration $\hat{\boldsymbol{p}}$. At equilibrium choices $(p_j, a_j)_{j=1,\dots,n}$, any local change in ethical behaviour Δa_i can be offset by a price change $\Delta p_i = -\phi_i'(a_i)\Delta a_i$ so as to keep supplier i's net price and therefore demand constant.*
Assumption 3 (constant returns to scale)**.** *A supplier's marginal cost of raising the morality of her production is proportional to her output: Her cost function can be written as $C_i(q_i; a_i) = c_i(a_i)q_i + d_i(q_i)$.*

Since, under perfect information, $\hat{p}_i \equiv p_i + \phi_i(a_i)$, we have:
Proposition 1 (Irrelevance (Dewatripont and Tirole, 2024))**.** *Supplier i's ethical behaviour a_i^* is uniquely defined by:*

$$\alpha_i W_i'(a_i^*) = c_i'(a_i^*) + \phi_i'(a_i^*) \tag{2}$$

Ethical behaviour does not depend on the demand curve D_i faced by firm i, and is therefore independent of the intensity of competition.

Proof. Using the definition of net prices, we can rewrite supplier i's objective function as

$$V_i = [\hat{p}_i - \phi_i(a_i) - c_i(a_i)]D_i(\hat{\boldsymbol{p}}) + \alpha_i \mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) \tag{3}$$

The proof is carried out by simply computing the first order condition of the objective function with respect to a_i and noting that by price flexibility firms can choose morality and net price independently and that firms' demands are unaffected by a change in a_i: $\frac{\partial \hat{p}_i}{\partial a_i} = 0$ so that $\frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial a_i} = 0 = \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial a_i}\ \forall i, j$ ■

Price flexibility plays a pivotal role in the irrelevance result insomuch as it allows firms to select their moral action a_i while keeping net price $\hat{p}_i$, and hence demand, constant. This second feature is precisely what is lost when consumers cannot observe the moral action of individual firms, as we assume. As we will show in the next section, rivals' net prices and demands are affected by a firm's moral action, so that competition is brought back into the picture. Furthermore, since the benefits of behaving morally are now only partially internalized by the firm itself, morality becomes also a public good and the number of firms in the market directly affects its optimal choice.

2.3 The relevance result

We now turn to our main result, using instead $\hat{p}_i \equiv p_i + \phi(a^M)$, where $a^M \equiv \frac{1}{n}\sum_j^n a_j$ is the average level of morality in the sector. We have :
Proposition 2. *Supplier i's ethical behaviour a_i^* is uniquely defined by:*

$$\alpha_i W_i'(a_i^*) = c_i'(a_i^*) + \frac{\phi'(a^{M*})}{n}(1-\rho)\,. \tag{4}$$

where ρ stands for the ratio $\rho \equiv \frac{R}{D_i(\hat{\boldsymbol{p}})}$ and $R \equiv \left[\hat{p}_i - \phi(a^M) - c_i\right]\sum_{k\neq i;k\neq 0}^n \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} + \alpha_i \sum_j W_j(a_j)\sum_{k\neq i;k\neq 0}^n \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k}$.

Proof. We rewrite again firm's i objective function using the definition of net prices:

$$V_i(\hat{p}_i, a_i) = [\hat{p}_i - \phi(a^M) - c_i(a_i)]D_i(\hat{\boldsymbol{p}}) + \alpha_i \mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) \tag{5}$$

Then, keeping $\hat{p}_i$ fixed by price flexibility the first derivative of the objective function (1) with respect to a_i yields:

$$\frac{\partial V_i}{\partial a_i} = -c_i'(a_i)\, D_i(\hat{\boldsymbol{p}}) - \frac{\phi'(a^M)}{n} \left(D_i(\hat{\boldsymbol{p}}) - \underbrace{\left[\hat{p}_i - \phi(a^M) - c_i\right] \sum_{\substack{k \neq i \\ k \neq 0}} \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} - \alpha_i \sum_j W_j(a_j) \sum_{\substack{k \neq i \\ k \neq 0}} \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k}}_{\equiv -R} \right) + \alpha_i W_i'(a_i) D_i(\hat{\boldsymbol{p}}). \tag{6}$$

Setting the derivative to zero and dividing by $D_i(\hat{\boldsymbol{p}})$ we obtain equation (4). ■

Corollary 1. *Assume that firms compete à la Cournot, where* $\boldsymbol{q}$ *is the vector of output quantities* $(q_1, q_2, \ldots, q_n)$*, then* $\rho = 0$ *and the moral erosion result becomes:*

$$\alpha_i W_i'(a_i^*) = c_i'(a_i^*) + \frac{\phi'(a^{M*})}{n} \tag{7}$$

Proof. In Cournot competition, for given total quantity $Q \equiv \sum_j^n q_j$ all net prices are equalized so that $\hat{p}_i = p_i + \phi(a^M) = P(Q)$ for all i. Firm i maximises $V_i = \left[P(Q) - \phi(a^M) - c_i(a_i)\right] q_i + \alpha_i \mathcal{W}_i(\boldsymbol{q}, \boldsymbol{a})$ choosing q_i and a_i. The market price $P(Q)$ is determined by the aggregate quantity which is fixed when maximising with respect to a_i (only prices adjust), so cross-price effects are absent. Since demand is not affected then the first order condition yields equation (7). ■

The level of competition now does affect the equilibrium choice of morality a_i^* that now depends on both the cross price elasticities and the number of firms in the market[8]. As an illustrative example, consider how individual morality choices change with the number of firms n. Assuming that n increases and consumers are morally concerned (i.e. $\phi'(a^M) < 0$), the marginal benefit of morality on the LHS of equation (4) does not change while the marginal cost on the RHS is subject to two effects. The first effect is a morality **"dilution" effect**. Each firm's contribution to the average morality a^M is diluted by the presence of more competitors so that each firm internalizes a smaller portion of the benefits of their moral action. This effect leads, all else equal, to a lower level of morality.[9] The second effect is a **"competition" effect**. As more firms enter the market, their market shares change according to ρ, a term capturing the degree of price competition in the market as measured by the cross price elasticities. Hence, the overall impact on individual morality of a change in the number of firms depends on the sign of ρ and its variation as the number of firms changes, which we will study in the next subsections.

The impact of new entry on the equilibrium choice of morality can be easily grasped visually in the case of Cournot competition, where the "competition" effect is absent and only the "dilution" effect remains. Morality

[8] The number of firms in the market would still matter directly if we assumed that $a^M \equiv \sum_{i=1}^n \omega_i \alpha_i$ with $\frac{\partial \omega_i}{\partial n} < 0$.

[9] This is the only effect in case of Cournot competition where new entrance always reduces individual morality.

is a public good and the impact internalized by each firm is diluted as new firms enter the market. In this case, the moral erosion result is straightforward: as the number of firms increases, the average morality a^M is diluted and the individual moral action a_i^* decreases when consumers positively value morality (left pane in figure 1).

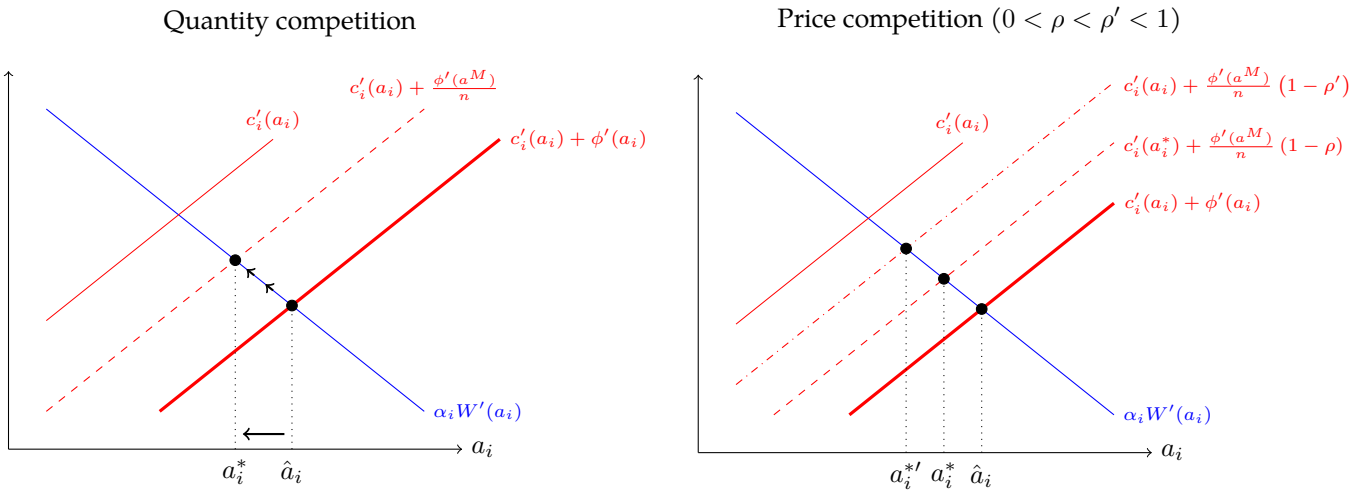

Figure 1: Equilibrium choice of morality by firm i with (a_i^*) and without $(\hat{a}_i)$ collective reputation information

In the graphs above, the blue curve represents the marginal benefit of morality, while the red curves represent the marginal cost of morality under different conditions. The outermost red curves represents the marginal cost of morality under perfect information (very thick solid), and under no concern for consumers' valuation for morality (thin solid). In the left panel, the dashed red curve represents the marginal cost of morality when there are n firms in the market and producers are competing in quantities. In the right panel, the dashed and dashdotted red curves represent the marginal cost of morality under price competition with n firms with low competition (ρ) and high competition (ρ') respectively.

2.3.1 Diagonal dominance and outside option

While in the Cournot case the moral erosion result is straightforward, in the Bertrand case the sign of ρ is not a priori clear and depends on the cross-price elasticities of demand. In this section we will show under what assumptions the sign of the wedge $(1-\rho)$ is unambiguously positive, so that the equilibrium level of morality is lower than under perfect information.

The net price FOC yields the following condition:

$$\frac{\partial V_i(\hat{p}_i, a_i)}{\partial \hat{p}_i} = 0 \quad \Longleftrightarrow \quad D_i(\hat{\boldsymbol{p}}) + \left[\hat{p}_i - \phi(a^M) - c_i\right] \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_i} + \alpha_i \sum_j W_j(a_j) \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_i} = 0 \tag{8}$$

$$D_i(\hat{\boldsymbol{p}}) = -\left[\hat{p}_i - \phi(a^M) - c_i\right] \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_i} - \alpha_i \sum_j W_j(a_j) \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_i}. \tag{9}$$

From equation (6), then, it is clear that

$$D_i(\hat{\boldsymbol{p}}) - R > 0 \iff -\left(\left[p_i - c_i\right] \sum_{k=1}^{n} \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} + \alpha_i \sum_j W_j(a_j) \sum_{k\neq 0} \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} \right) > 0 \tag{10}$$

$$\iff -\left[p_i - c_i\right] \Sigma_i - \alpha_i \sum_{j\neq 0} W_j(a_j)\, \Sigma_j - \alpha_i W_0(a_0)\Sigma_0 > 0. \tag{11}$$

Where we rewrote firm i's markup in standard form $\left[p_i - c_i\right]$ and we defined $\Sigma_j \equiv \sum_{k\neq 0} \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k}$. The quantity Σ_j is the response of demand D_j to an increase in all net prices $\hat{p}_1, \ldots, \hat{p}_n$ by one unit — it measures whether the market expands or contracts when every firm becomes more expensive at once (excluding the outside option). Under condition (10), the wedge $(1-\rho)$ is positive and the moral erosion result holds.

The problematic term is the last one, $-\alpha_i W_0(a_0)\Sigma_0$. Indeed, under the weak assumption of diagonal dominance[10] , when products are substitutes, the sum of all price derivatives excluding the outside option, Σ_j, is negative for each firm $j \neq 0$:

$$\Sigma_j \equiv \sum_{k\neq 0} \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} = \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_j} + \sum_{\substack{k\neq j \\ k\neq 0}} \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k} < 0 \tag{12}$$

However, firms' internalize the value consumers switching to the outside option and Σ_0 is positive since the outside option is a substitute for all other products. This entails that for condition (10) to hold, the moral valuation of the outside option should not be too high. This would not pose issues if, for example, the internalized morality of the outside option were zero, $W_0(a_0) = 0$, or negative, as opposed to the valuation for demand of the rivals[11].

Economically, $\Sigma_j < 0$ says that a uniform rise in all firms' net prices pushes some consumers to the outside option as the reduction in demand for firm j is not fully offset by the increase in demand for its rivals: the market contracts. This is a standard feature of the workhorse discrete-choice demand models with an outside good such as the family of logit models. Conversely, in case of a fully covered market (e.g. Hotelling competition or logit without an outside option), a uniform price shift is neutral since every consumer still buys from some firm and $\Sigma_j = 0$ for all j. In this latter case, any given firm does not internalize the moral benefits of its action neither in terms of increased demand for its product nor in higher price. Consequently, consumers' moral valuation does not affect the firm's morality choice at equilibrium anymore, $\alpha_i W_i'(a_i^*) = c_i'(a_i^*)$ and the lowest possible level of morality is attained.

In a similar way, as substitutability between products increases and the Σ_j's approach 0, the market becomes

[10] The demand system is diagonally dominant if for every firm j the own-price effect is larger than the sum of the cross-price effects: $\left|\frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_j}\right| > \sum_{k\neq j} \left|\frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_k}\right|$. Diagonal dominance is a standard, well-studied assumption dating back at least until the works of McKenzie (1960), Arrow and Hahn (1971) and Vives (1985), and it is often invoked to establish equilibrium existence, uniqueness and stability throughout general-equilibrium and oligopoly theory.

[11] More precisely, a sufficient condition for equation (10) to hold is $\alpha_i \sum_{\substack{j\neq 0 \\ j\neq i}} (W_j(a_j) - W_0(a_0))\left(\frac{\Sigma_i}{b_{own}}\, b_{cross} - \Sigma_j\right) > 0$ where $b_{own} \equiv \frac{\partial D_i(\hat{\boldsymbol{p}})}{\partial \hat{p}_i}$ and $b_{cross} \equiv \frac{\partial D_j(\hat{\boldsymbol{p}})}{\partial \hat{p}_i}$ for $j \neq i$.

more competitive and firms have fewer incentives to behave morally since this would not turn into higher profits (as $\Sigma_j \to 0 \ \forall j \neq 0$, then $\Sigma_0 \to 0$ too and condition (10) is more likely to hold.) This instance is illustrated in the right pane of Figure 1 where an increase in competition (from ρ to ρ') leads to a lower level of morality ($a_i^{*\prime} < a_i^*$).

3 A few examples

We stated above that the optimal morality level a_i^* is affected by a direct dilution effect, in the term $1/n$, and a competition effect, in the term ρ. In this section we study how the optimal choice of morality is affected by competition and new entrants in a simple specific price-setting model[12].

To facilitate exposition we shall assume that all firms are symmetric so that $c_i(a_i) = c(a_i)$, $W_i(a_i) = W(a_i)$ and $\alpha_i = \alpha$ for all i, and that the impact of morality on each firm's welfare is proportional to its own output only, that is, $\mathcal{W}_i(a_i) = W_i(a_i)D_i(\hat{\boldsymbol{p}})$ for all i. This latter condition is what Dewatripont and Tirole (2024) call narrow bracketing.

3.1 Narrow bracketing

Throughout this section we adopt the following functional forms: a quadratic morality cost, $c_i(a_i) = \frac{1}{2}a_i^2$; a linear consumer valuation of the sector's average morality, $\phi(a^M) = -\hat{\phi}\, a^M < 0$; and narrow bracketing $\mathcal{W}_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) = \alpha_i \ln(1 + a_i)D_i(\hat{\boldsymbol{p}})$, where $W_i(a_i) = \ln(1 + a_i)$.

Firms' objective functions now is given by

$$V_i(\hat{\boldsymbol{p}}, \boldsymbol{a}) = \left[\hat{p}_i + \hat{\phi}\, a^M - \frac{1}{2}a_i^2\right] D_i(\hat{\boldsymbol{p}}) + \alpha_i \ln(1 + a_i)D_i(\hat{\boldsymbol{p}}), \tag{13}$$

and substituting $c_i'(a_i) = a_i$, $W_i'(a_i) = 1/(1 + a_i)$ and $\phi'(a^M) = -\hat{\phi}$ into the general morality condition (4), the symmetric equilibrium level of morality under price competition solves

$$a_i^* - \frac{\hat{\phi}}{n}(1 - \rho) = \frac{\alpha_i}{1 + a_i^*}. \tag{14}$$

An advantage of narrow bracketing is that the term $1 - \rho$ collapses neatly as we now show.
For given firm i, define the mark-up μ and the own-price derivative b_{own} as

$$\mu \ \equiv \ p_i - c_i(a_i) + \alpha_i W_i(a_i), \qquad b_{own} \ \equiv \ \frac{\partial D_i}{\partial \hat{p}_i} < 0. \tag{15}$$

Under narrow bracketing only the $j = i$ term survives in the welfare part of R, so $R = \mu \sum_{k\neq i;k\neq 0} \partial D_i/\partial \hat{p}_k$. Moreover, we can also rewrite the price FOC (8) as $D_i + \mu\, b_{own} = 0 \implies = D_i = -\mu\, b_{own}$. Hence

$$1 - \rho \ \equiv \ 1 - \frac{R}{D_i} \ = \ 1 + \frac{\sum_{k\neq i;k\neq 0} \partial D_i/\partial \hat{p}_k}{b_{own}} \ = \ \frac{b_{own} + \sum_{k\neq i;k\neq 0} \frac{\partial D_i}{\partial \hat{p}_k}}{b_{own}} \ = \ \frac{\Sigma_i}{b_{own}}, \tag{16}$$

[12] We add in appendix (section B) the same examples in the case of a Cournot oligopoly

where $\Sigma_i = \sum_k \partial D_i/\partial \hat{p}_k < 0$ is the market-expansion term defined in (12). Thus $1-\rho$ is simply the ratio of the uniform-price change to the own-price derivative and is included between zero and one by diagonal dominance.

We now evaluate (14) in a simple linear demand system, and then ask whether collusion or common ownership can switch this channel off again.

3.2 Differentiated Bertrand oligopoly with linear demand

Take the symmetric linear demand

$$D_i(\hat{\boldsymbol{p}}) = \frac{1}{n}\Big[\alpha - \beta\big((1+\gamma)\hat{p}_i - \gamma\,\bar{\hat{p}}\big)\Big], \qquad \bar{\hat{p}} \equiv \frac{1}{n}\sum_{k=1}^{n}\hat{p}_k, \qquad \alpha,\beta>0,\ \gamma\geq 0, \tag{17}$$

where the parameter γ indexes substitutability (if $\gamma = 0$, products are independent; if $\gamma \to \infty$ products are homogeneous).

Differentiating (17), we obtain the own- and cross-price derivatives

$$\frac{\partial D_i}{\partial \hat{p}_i} \equiv b_{own} = -\frac{\beta\big[(1+\gamma)n-\gamma\big]}{n^2}, \qquad \frac{\partial D_i}{\partial \hat{p}_k} = \frac{\beta\gamma}{n^2}\ (k\neq 0\neq i), \tag{18}$$

which, by the linearity of the model, are constants and independent of net prices and thus of moral actions $\boldsymbol{a}$. Hence

$$\Sigma_i = -\frac{\beta\big[(1+\gamma)n-\gamma\big]}{n^2} + (n-1)\frac{\beta\gamma}{n^2} = -\frac{\beta}{n} < 0, \tag{19}$$

Note that total demand $\sum_i D_i = \alpha - \beta\bar{\hat{p}}$ depends only on the average price so that for a unit increase in price by all firms, β consumers switch to the outside option ($-\beta/n$ per firm).

Using (16), (18) and(19)

$$1-\rho = \frac{\Sigma_i}{b_{own}} = \frac{\beta/n}{\beta\big[(1+\gamma)n-\gamma\big]/n^2} = \frac{n}{\Delta}, \qquad \Delta \equiv (1+\gamma)n-\gamma > 0. \tag{20}$$

Substituting (20) into (14), we find the condition for the symmetric equilibrium level of morality a^*

$$a^* - \frac{\hat{\phi}}{\Delta} = \frac{\alpha_i}{1+a^*} \tag{21}$$

For $\gamma = 0$, $\Delta = n$, products are independent and (21) coincides with the equilibrium Cournot condition ((37) in appendix): with independent products there is no cross-price channel, and price competition degenerates into n "isolated" morality-sharing monopolists, each affected only by the $1/n$ dilution effect. As $\gamma \to \infty$, products become more substitutable but the attractiveness of the outside option remains bounded, $b_{own} \to \infty$ while $\Sigma_i = -\beta/n$, and since ρ approaches unity the wedge $1-\rho$ goes to zero. Profit concerns rise to the point where it is no longer profitable to account for consumers' valuation for morality at all. The Dewatripont–Tirole irrelevance result re-emerges, although morality now attains its lowest possible level as displayed in the right pane of Figure 1. This is the worst scenario for moral consumers.

How does morality evolve with the number of competitors? Rewriting the morality FOC as $F(a_i, n) \equiv -a_i + \frac{\hat{\phi}}{\Delta} + \frac{\alpha_i}{1+a_i} = 0$, the implicit function theorem yields

$$\frac{\partial a_i}{\partial n} = -\frac{\hat{\phi}(1+\gamma)}{\Delta^2} \cdot \frac{(1+a_i)^2}{(1+a_i)^2 + \alpha_i} \; < \; 0 \tag{22}$$

Now the impact of marginal entry decreases as products become more substitutable (γ increases). Although perhaps counterintuitive, the reason for this result is the interplay between the moral dilution effect and the competition effect. When the competition effect is strong, the term $(1-\rho)$ is small, and the impact of new entry is small since morality is already low. Conversely, when competition is weak (small γ), moral dilution plays a stronger role since firms don't want to share the benefits of their moral action with rivals.

3.3 Tacit collusion

First, consider a cartel that jointly sets all n net prices $\hat{\boldsymbol{p}}$ and n moral actions $\boldsymbol{a}$ to maximise total industry profit while each member still cares only about its own narrow-bracket ethical welfare $\alpha_i \ln(1+a_i) D(\hat{\boldsymbol{p}})$. The cartel's objective is the sum of the individual profits:

$$V^c(\hat{\boldsymbol{p}}, \boldsymbol{a}) \; = \; \sum_{i=1}^{n} \left\{ \left[\hat{p}_i + \hat{\phi}\, a^M - \tfrac{1}{2} a_i^2 \right] D_i(\hat{\boldsymbol{p}}) \; + \; \alpha_i \ln(1+a_i)\, D_i(\hat{\boldsymbol{p}}) \right\}. \tag{23}$$

Since firms are aware of each other's ethical choice and coordinate their prices, price flexibility expands naturally to all colluding firms' so that each firm's demand is not affected by the moral actions, but only by the net prices $\hat{\boldsymbol{p}}$. [13]

Differentiating the cartel's objective with respect to a_i yields we obtain:

$$\frac{\partial V^c}{\partial a_i} \; = \; \underbrace{\frac{\hat{\phi}}{n} \sum_{j=1}^{n} D_j(\hat{\boldsymbol{p}})}_{\text{industry-wide WTP gain}} \; + \left[-a_i + \frac{\alpha_i}{1+a_i} \right] D_i(\hat{\boldsymbol{p}}) \; = \; 0. \tag{24}$$

If producers are symmetric, each firm chooses the same net price and moral action, $\hat{p}_i = \hat{p}$ and $a_i = a$, and sells an equal fraction of the total output $D(\hat{\boldsymbol{p}}) \equiv \frac{\sum_{i=1}^{n} D_i(\hat{p})}{n}$, so that the cartel's FOC (24) reduces to

$$a^c - \hat{\phi} = \frac{\alpha}{1+a^c} \tag{25}$$

exactly the Dewatripont and Tirole (2024) full-information level of morality, independent of n and of competition. By coordinating their prices and moral actions, the cartel members not only shut down competition but also internalise the moral benefits of their action, thereby remedying the problem of moral dilution.

[13] In the appendix we derive the cartel optimal ethical choice function using "gross" prices p_i and ethical choices a_i as the control variables of the firms

Second, consider a firm that decides to collude if its profit within the cartel is higher than its profit outside. This is the case if

$$V_i^c = \left(\hat{p} + \hat{\phi} \cdot a - \frac{1}{2}a^2\right) \frac{\sum_j D_j(\hat{\boldsymbol{p}})}{n} + \alpha_i \ln(1+a) \frac{\sum_j D_j(\hat{\boldsymbol{p}})}{n} \tag{26}$$

for which the resulting equilibrium level of morality is the same as in the full information case in (25).

Moreover, if firms revert to the Bertrand-Nash equilibrium in case of deviation, for a discount factor $\delta \in [0,1]$, sustainability requires that firms are better-off colluding rather than deviating and choosing a different net price or morality:

$$\frac{V_i^c}{1-\delta} \geq \max_{\hat{p}_i, a_i} \left\{ \left(\hat{p}_i + \hat{\phi} \cdot a^M - \frac{1}{2}a_i^2\right) D_i(\hat{p}_i) + \alpha \ln(1+a_i) D_i(\hat{p}_i) + \frac{\delta}{1-\delta} V_i^{Nash} \right\} \tag{27}$$

which yields the same equilibrium level of morality as in equation (21):

$$a^* - \frac{\hat{\phi}}{(1+\gamma)n - \gamma} = \frac{\alpha}{1+a^*} \tag{28}$$

Since $a^c > a^*$ whenever $n > 1$ (for given $\gamma > 0$), for suitable parameter configurations such that collusion is sustainable, the equilibrium level of morality is higher under collusion than under Bertrand competition.

3.4 Common ownership

Consider instead partial cross-participations $\lambda_i \in [0,1]$ [14]: firm i maximises $\mu_i D_i(\hat{\boldsymbol{p}}) + \lambda_i \sum_{j \neq i} \mu_j D_j(\hat{\boldsymbol{p}})$, where $\mu_i \equiv p_i - c_i(a_i) + \alpha_i \ln(1+a_i)$ for each firm i. bracketing. Assuming symmetry once again the price FOC reads

$$\mu = \frac{D_i}{b_{own} - \lambda_i(n-1)\frac{\beta\gamma}{n^2}} = \frac{D_i}{b_{own} - \lambda_i(n-1)b_{cross}} = \frac{D_i\, n^2}{\beta\big[\Delta - \lambda_i(n-1)\gamma\big]},$$

and the morality FOC

$$\left(-a_i + \frac{\alpha_i}{1+a_i}\right) D_i - \frac{\hat{\phi}}{n} \mu \left[1 + \lambda_i(n-1)\right] \Sigma_i = 0,$$

which, using $\Sigma_i = -\beta/n$, substituting the price FOC and simplifying, yields

$$a_i^* - \hat{\phi} \cdot \frac{1 + \lambda_i(n-1)}{\Delta - \lambda_i(n-1)\gamma} = \frac{\alpha_i}{1+a_i^*}. \tag{29}$$

At $\lambda_i = 0$ this collapses to the oligopoly condition (21); at $\lambda_i = 1$ the wedge ratio equals 1 for every n and γ (both numerator and denominator reduce to n), recovering exactly the full-collusion result (25). For any $\lambda_i \in (0,1)$ the wedge lies strictly between the oligopoly wedge $1/\Delta$ and the monopoly wedge as the intuition goes, by internalising each other's objective, common ownership attenuates at once the impact of competition and of imperfect information on morality.

[14] In order to deal with a single parameter, we assume that the cross participation held by firm i into firm j is the same for all $j \neq i$

4 Conclusion

Do market forces erode morality? In a recent paper, Dewatripont and Tirole (2024) revisit this age-old issue in economics. They show that, contrary to a commonly held view, increased competition does not affect the moral behaviour of the firms, which they call the "irrelevance result". In this note, we investigate the robustness of this result by considering the case in which the moral actions taken by a specific firm are not directly observable by the consumers, while the morality of a sector is.

As we show that under mild assumptions on demand and on the ethical value of the outside option for producers, as long as consumers are morally motivated, increased competition does erode morality. Competition however does not affect the moral motivation directly internalized by the firm, for which the irrelevance result still holds. In particular, if consumers are not morally concerned and, thus, do not reward through higher prices firms that behave morally, the equilibrium level of morality is independent of the strength of competition.

Under Cournot competition, the moral action of a firm does not spill over into rivals' demand, so that imperfect observability of individual moral actions takes the form of a morality "dilution": since morality is a public good, the benefits of a firm's moral action are shared with other firms in the sector so that the individual firm's incentive to act morally is diluted as the number of rivals grows. On the other hand, under Bertrand competition, the consumers' valuation of morality is routed through the sector-wide average rather than through each firm's own net price. This perturbs every competitor's perceived net price, and the resulting cross-firm interactions further erode morality as competition increases.

References

Acharya, Viral V, Peter DeMarzo, and Ilan Kremer. 2011. "Endogenous information flows and the clustering of announcements." *American Economic Review* 101 (7):2955–2979. 2

Arrow, Kenneth Joseph and Frank Horace Hahn. 1971. *General competitive analysis*, vol. 4. Holden-Day San Francisco. 8

Baland, Jean-Marie and Cédric Duprez. 2009. "Are labels effective against child labor?" *Journal of Public Economics* 93 (11-12):1125–1130. 2

Dewatripont, Mathias and Jean Tirole. 2024. "The morality of markets." *Journal of Political Economy* 132 (8):2655–2694. 2, 3, 4, 5, 9, 11, 13, 16

Dragusanu, Raluca, Daniele Giovannucci, and Nathan Nunn. 2014. "The economics of fair trade." *Journal of economic perspectives* 28 (3):217–236. 2

Fishman, Arthur, Israel Finkelstein, Avi Simhon, and Nira Yacouel. 2018. "Collective brands." *International Journal of Industrial Organization* 59:316–339. 3

Levin, Jonathan. 2009. "The dynamics of collective reputation." *The BE Journal of Theoretical Economics* 9 (1). 3

McKenzie, Lionel W. 1960. "Stability of equilibrium and the value of positive excess demand." *Econometrica: Journal of the Econometric Society* :606–617. 8

Neeman, Zvika, Aniko Öry, and Jungju Yu. 2019. "The benefit of collective reputation." *The rand journal of economics* 50 (4):787–821. 3

Nocke, Volker and Roland Strausz. 2023. "Collective brand reputation." *Journal of Political Economy* 131 (1):1–58. 3

Olson, Mancur Jr. 1968. *The logic of collective action: Public goods and the theory of groups.* 3

Ponthière, Grégory and Nicolas Stevens. 2025. "The morality of markets. A critique." *Mathematical Social Sciences* 134:14–19. 3

Tirole, Jean. 1996. "A theory of collective reputations (with applications to the persistence of corruption and to firm quality)." *The Review of Economic Studies* 63 (1):1–22. 3

Vives, Xavier. 1985. "On the efficiency of Bertrand and Cournot equilibria with product differentation." *Journal of Economic Theory* 36 (1):166–175. 8

Appendix

A Collusion in morality and gross prices

We showed that collusion in a symmetric Bertrand setting can be simplified by applying price flexibility and implementing a convenient change of variables. If instead the cartel is described as choosing the "gross" prices p_i — the economically primitive instrument — one must substitute the pricing condition into the morality condition since firms are not assumed to automatically adjust their gross prices to keep net prices constant when a colluding rival unilaterally changes its moral action. However, we now explicitly verify that the same answer obtains.

Using $p_j = \hat{p}_j + \hat{\phi} a^M$, rewrite (23) as

$$V^c(\boldsymbol{p}, \boldsymbol{a}) = \sum_{j=1}^{n} \underbrace{\left[p_j - \tfrac{1}{2}a_j^2 + \alpha \ln(1 + a_j)\right]}_{=\mu_j} D_j(\hat{\boldsymbol{p}}), \qquad \hat{p}_k = p_k + \phi(a^M) = p_k - \hat{\phi}\, a^M \quad \forall k. \tag{30}$$

The cartel members now coordinate on $(\boldsymbol{p}, \boldsymbol{a})$, and morality does move demand, because it moves every net price:

$$\frac{\partial \hat{p}_k}{\partial a_i} = -\hat{\phi}\, \frac{\partial a^M}{\partial a_i} = -\frac{\hat{\phi}}{n} \qquad \text{for every } k = 1, \ldots, n. \tag{31}$$

A unilateral increase in a_i lowers all n net prices by the same amount $\hat{\phi}/n$.

From (30) and (31) we write the price FOC as:

$$\frac{\partial V^c}{\partial p_i} = D_i(\hat{\boldsymbol{p}}) + \sum_{j=1}^{n} \mu_j \frac{\partial D_j}{\partial \hat{p}_i} = 0 \implies \sum_{j=1}^{n} \mu_j \frac{\partial D_j}{\partial \hat{p}_i} = -D_i(\hat{\boldsymbol{p}}), \tag{32}$$

As for the morality FOC, now deriving (30) with respect to a_i has a direct term through all demands:

$$\begin{aligned}
\frac{\partial V^c}{\partial a_i} &= \left[-a_i + \frac{\alpha}{1 + a_i}\right] D_i(\hat{\boldsymbol{p}}) + \sum_{j=1}^{n} \mu_j \sum_{k=1}^{n} \frac{\partial D_j}{\partial \hat{p}_k} \frac{\partial \hat{p}_k}{\partial a_i} \\
&= \left[-a_i + \frac{\alpha}{1 + a_i}\right] D_i(\hat{\boldsymbol{p}}) - \frac{\hat{\phi}}{n} \sum_{j=1}^{n} \mu_j \sum_{k=1}^{n} \frac{\partial D_j}{\partial \hat{p}_k} \\
&= \left[-a_i + \frac{\alpha}{1 + a_i}\right] D_i(\hat{\boldsymbol{p}}) - \frac{\hat{\phi}}{n} \sum_{k=1}^{n} \underbrace{\sum_{j=1}^{n} \mu_j \frac{\partial D_j}{\partial \hat{p}_k}}_{= -D_k(\hat{\boldsymbol{p}})} = 0.
\end{aligned} \tag{33}$$

Imposing symmetry ($\mu_j = \mu$, $D_i = D$, $a_i = a$) (33) becomes

$$\left[-a + \frac{\alpha}{1 + a}\right] D + \hat{\phi}\, D = 0. \tag{34}$$

and dividing by $D > 0$ delivers exactly (25):,

$$a^c - \hat{\phi} = \frac{\alpha}{1 + a^c}. \tag{35}$$

B A Cournot example

Now we introduce a slight variation in the original examples with the case of a particular sector producing a homogeneous good and characterized by a Cournot oligopoly. We assume that competitors are symmetric and consider the following functional forms: $C(a_i, q_i) = \frac{1}{2}a_i^2 q_i$, $\phi_i(a^M) = -\hat{\phi} \cdot a^M$ (where consumers share the same valuation for morality and are ethically responsible: $\frac{\partial \phi_i(a^M)}{\partial a^M} = -\hat{\phi} < 0$) , and welfare function $\mathcal{W}_i(\boldsymbol{q}, \boldsymbol{a}) = \alpha_i \left[\sum_j^n \ln(1 + a_j) q_j\right]$. In Cournot competition, for total quantity $Q = \Sigma_{j=1}^n q_j$, net prices are equalized so that $P(Q) = \hat{p}_i = p_i + \phi_i(a^M)$ for each firm i. Each firm in the sector maximizes:

$$V_i = \left(P(Q) + \hat{\phi} \cdot a_i - \frac{1}{2}a_i^2\right) q_i + \alpha_i \ln(1 + a_i) q_i + \alpha_i \sum_{j \neq i} \ln(1 + a_j) q_j \tag{36}$$

The equilibrium level of morality is then given by:

$$a_i - \frac{1}{n}\hat{\phi} = \frac{\alpha_i}{1 + a_i} \tag{37}$$

Defining the function $F(a_i, n) = -a_i + \frac{1}{n}\hat{\phi} + \frac{\alpha_i}{1+a_i}$, and applying the implicit function theorem we get

$$\frac{\partial a_i}{\partial n} = -\frac{\hat{\phi}}{n^2} \frac{(1 + a_i)^2}{(1 + a_i)^2 + \alpha_i} < 0 \tag{38}$$

As can be seen in this simple example, oligopolist firms competing à la Cournot in the same market will choose lower levels of moral actions as the number of firms n increases if consumers are responsible ($-\hat{\phi} < 0$). This is a result of moral "dilution" alone. Firms face a "collective action" problem alone, as each firm has an incentive to free-ride on the moral efforts of others. We now discuss two variations that allow for some forms of agreements between firms that partially solve the "collective action" problem, namely the possibility of collusion and the case of cross-participations. These two agreements affect differently the choice of morality by individual firm, according to its degree of internalization the overall market's morality.

B.1 Tacit collusion

In the case of tacit collusion, we keep with the assumption of narrow bracketing like Dewatripont and Tirole (2024). In this case firms' valuation of their moral conduct is proportional to their own output only, that is, $\mathcal{W}_i(\boldsymbol{q}, \boldsymbol{a}) = \mathcal{W}_i(q_i, a_i) = \ln(1 + a_i) q_i$. [15] Consider n symmetric firms each selecting the same q_i and a_i to maximise the per-firm collusive payoff Π_i^c:

[15] By narrow bracketing, we refer to this behaviour by which firms care only about the social impact of their own activity, and not about the social impact of the industry's aggregate activity. Dewatripont and Tirole (2024) show that the optimal cartel morality increases in n under broad bracketing, since each supplier takes credit for what others do.

$$\Pi_i^c = \left(P(Q) + \hat{\phi} \cdot a - \frac{1}{2}a^2 \right) \frac{\sum_j q_j}{n} + \alpha_i \ln(1+a) \frac{\sum_j q_j}{n} \tag{39}$$

The resulting equilibrium level of morality is the same as in (25).

$$a^c - \hat{\phi} = \frac{\alpha}{1+a^c} \tag{40}$$

On the other hand, sustainability requires that firms are better-off colluding rather than deviating and choosing a different level of output or morality:

$$\frac{\Pi_i^c}{1-\delta} \geq \max_{q_i, a_i} \left\{ \left(P(Q) + \hat{\phi} \cdot a^M - \frac{1}{2}a_i^2 \right) q_i + \alpha_i \ln(1+a_i) q_i + \frac{\delta}{1-\delta} \Pi_i^{Nash} \right\} \tag{41}$$

where $\delta \in [0,1]$ is the standard discount factor and Π_i^{Nash} is the Cournot-Nash static outcome firms revert to in case of deviation [16]. Assuming symmetric firms so that in equilibrium $q_i = q_j \; \forall i,j$, for suitable parameter configurations such that collusion is sustainable, the equilibrium level of morality is higher under collusion than under Cournot competition.

B.2 Common ownership

Assuming narrow bracketing again, we can also assess the impact on morality of common ownership, which takes the form of cross participations λ_i among all firms in the sector. Each (identical) firm i now maximizes the weighted sum of its own profit and its share λ_i of the aggregate profit of all the other firms in the sector:

$$\Pi_i = \left(P(Q) + \hat{\phi} \cdot a^M - \frac{1}{2}a_i^2 \right) q_i + \alpha_i \ln(1+a_i) q_i + \lambda_i \sum_{j \neq i} \left\{ \left(P(Q) + \hat{\phi} \cdot a^M - \frac{1}{2}a_j^2 \right) q_j + \alpha_j \ln(1+a_j) q_j \right\} \tag{42}$$

so that the moral choice of firm i is given by[17]: $a_i - \frac{1}{n}\hat{\phi}\left(1 + \lambda_i \sum_{j \neq i} \frac{q_j}{q_i}\right) = \frac{\alpha_i}{1+a_i}$.
Assuming symmetric firms yields

$$a_i - \frac{1}{n}\hat{\phi}\left(1 + \lambda_i (n-1)\right) = \frac{\alpha_i}{1+a_i}. \tag{43}$$

The impact of competitive pressure is reduced under cross participation, and gets smaller as λ_i increases. Contrary to tacit collusion, firms now internalize part of the increase in competitors' profits, from both *their* sales and *their* perceived morality. As a consequence, the incentives to behave more morally increase as the rate of internalization λ_i rises.

In particular, the above equation implies, as before, the same moral behaviour as a monopolist when λ_i approaches one: $a_i - \hat{\phi} = \frac{\alpha_i}{1+a_i}$. However, the underlying mechanism is completely different. In the case of a monopoly, consumers do perfectly see the moral conduct of the monopolist which induces it to behave

[16] We are implicitly assuming that time is discrete $t \in \{0, 1, 2...\}$

[17] Note that for this result to hold it is not necessary that firms internalize the welfare that their rivals get from morality, but rather their "net" profits

relatively more morally (if consumers value morality). By contrast, in the present case consumers don't see each individual firm's morality. Instead, each firm internalizes the sector's overall profits and, therefore, chooses a moral behaviour which contributes to the sector's overall morality.